

1       What is Claimed Is:

2           1.       A communications system comprising:

3               a base station having an adaptive antenna with a plurality of main array  
4               antenna elements for generating a plurality of communication beams; and

5               a gateway station coupled to said base station, said gateway station  
6               forming a plurality of beams commands by communicating a plurality of control  
7               signals to the base station to form the communication beams.

1           2.       A communications system as recited in claim 1 wherein said  
2       adaptive antenna comprises a plurality of panels comprise the plurality of main array  
3       elements.

1           3.       A communications system as recited in claim 1 wherein said  
2       base station comprises a plurality of auxiliary elements for canceling interference  
3       between the communication beam.

1           4.       A communications system as recited in claim 1 wherein said  
2       auxiliary elements are weighted to provide interference canceling.

1           5.       A communications system as recited in claim 1 wherein said  
2       gateway station is rf coupled to said base station.

1           6.       A communications system as recited in claim 1 wherein said  
2       base station is wireless.

1           7.       A communications system as recited in claim 1 wherein said  
2       gateway station is positioned on a stratospheric platform

1           8.       A communications system as recited in claim 1 wherein said  
2       reconfigurable antenna comprises a phased array antenna.

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1                   9.    A communications system as recited in claim 1 wherein said  
2 main array is a modular.

1                   10.   A communications system as recited in claim 1 wherein said  
2 main array comprises a plurality of modules coupled to a bus.

1                   11.   A communications system as recited in claim 1 wherein said  
2 bus is coupled to a controller.

1                   12.   A communications system as recited in claim 1 further  
2 comprising a plurality of users receiving said communications beam.

1                   13.   A communications system as recited in claim 1 further  
2 comprising a limiter coupled within a feedback path.

1                   14.   A communications system as recited in claim 1 further  
2 comprising a nulling processor.

1                   15.   A communications system as recited in claim 14 wherein said  
2 nulling processor comprises an element code despread and a user code despread.

1                   16.   A communications system as recited in claim 15 wherein said  
2 nulling processor comprises a weighted feedback loop similarly coupled to an output  
3 signal.

1                   17.   A communications system as recited in claim 15 wherein said  
2 nulling processor comprises auxiliary elements coupled to an output signal.

1                   18.   A communications system as recited in claim 1 wherein said  
2 base station comprises a plurality of summing blocks coupled to said main array  
3 element for generating a summed signal, said gateway station comprising an analog-  
4 to-digital converter coupled to a noise injection circuit and said summed signal, said  
5 summed signal coupled to a demultiplexer and a digital beam forming circuit.

1                   19. A communication system as recited in claim 1 wherein said  
2 base station comprises a user code despreading circuit coupled to an element code  
3 despreading circuit which is coupled to said main array elements.

1                   20. A communications system comprising:  
2                   a plurality of wireless base stations having adaptive antennas with a  
3 plurality of main array antenna elements for generating a plurality of communication  
4 beams;

5                   a gateway station coupled to said plurality of wireless base stations  
6 through a plurality of multiple dynamic links, said gateway station forming a plurality  
7 of beams with a plurality of data packets by communicating plurality of a control  
8 signals to the base station to form the communication beams using at least one link  
9 from a first base station and a second link through a second of the base station.

1                   21. A method of operating a communication system having a  
2 gateway station and a plurality base station comprising:

3                   dividing a communication signal into a plurality of multiple dynamic  
4 links at the gateway station;

5                   directing the multiple dynamic links to a plurality of base stations; and  
6                   coupling the multiple dynamic links through the plurality of base  
7 stations.

1                   22. A method as recited in claim 21 further comprising canceling  
2 interference between said multiple dynamic links.